

List of Claims

Claims 1 - 38 (Cancelled)

Claims 39 - 59 (New)

39. (New) Slips for securing a drill string comprising:

(a) a plurality of tubular-gripping slips mounted for radial movement toward and away from the drill string;

(b) moving means for moving the slips radially whereby the moving means move the slips into or out of contact with the drill string at substantially ninety degrees to the drill string;

(c) said slips including sloping external surfaces and in which said moving means comprises wedges which contact said sloping surfaces thereby moving said wedges over said sloping surfaces causing radial movement of the slips; and

(d) wedge moving means for applying a force to said wedges to move said wedges over said sloping surfaces of the slips.

40. (New) The slips as claimed in Claim 39 in which there are two sets of wedges between said wedge moving means and said slips, said first set of wedges being in contact with said sloping surfaces of the slips, and said second set of wedges being in contact with said first set of wedges.

41. (New) The slips as claimed in Claim 40 in which said first set of wedges are coarse wedges and said second set of wedges are fine wedges.

42. (New) The slips as claimed in Claim 40 including a spring located between said first and second sets of wedges.

43. (New) The slips as claimed in Claim 41 including ridges on said coarse wedges such that said sloping surfaces are at an angle greater than about 10 degrees with respect to the axis of the drill string.

44. (New) The slips of Claim 39 in which said moving means comprises first and second actuating links pivotally connected to each other.

45. (New) The slips of Claim 39 including spring means positioned between said wedge moving means and said wedge.

46. (New) The slips of Claim 39 wherein said slips are vertically positioned so as to engage a drill string having a tool joint, and further including additional slips positioned to engage the tool joint to provide failsafe support of the drill string.

47. (New) The slips of Claim 39 wherein said slips include a stepped surface.

48. (New) The slips of Claim 39 including bearing means for rotating said wedges about the vertical axis of the drill string.

49. (New) The slips as claimed in Claim 39 wherein said slips have surfaces for contacting and securing said drill string, and wherein said surfaces are non-ridged smooth surfaces for engaging and securing said drill string without damaging the outer surfaces of the tubular comprising said drill string.

50. (New) A slips assembly comprising:

(a) a plurality of tubular-gripping slips mounted for radial movement about a tubular; and

(b) moving means for moving said slips in a substantially purely radial motion whereby said slips do not damage said tubular in engaging and vertically securing said tubular.

51. (New) The slips assembly as claimed in Claim 50 including a sloping external surface on said slips and in which said moving means includes wedge means for contacting said sloping surface and moving said slips in a substantially purely horizontal plane.

52. (New) A slips system for engaging and securing a drill string comprising a plurality of tubulars having tool joints, each tool joint including a vertically extending surface portion and a shoulder portion comprising:

(a) a first set of slips positioned for movement toward and away from said vertically extending surface portion;

(b) a second set of failsafe slips positioned for movement toward and away from said shoulder portion; and

(c) power actuator means connected to said slips for moving said first set of slips into gripping engagement with said vertical surface portions of the tubulars and for moving said second set of slips into engagement with said shoulder portion.

53. (New) The slips system of Claim 52 wherein said system includes link means connected between said power actuator means and said first set of slips for moving said first set of slips into engagement with a substantially purely radial, horizontal movement whereby the tool joint is not scored.

54. (New) A slip assembly for gripping a tubular having a longitudinal axis comprising:

(a) a plurality of tubular-gripping slips disposed about said tubular:

(b) a support;

(c) means mounted on said support for moving said slips radially into contact with, and away from, said tubular; and

(d) a plurality of links each having one end pivotally mounted on one of said slips and the other end pivotally mounted on said support, the arrangement being such that, in use, said links constrain the vertical movement of said slips such that said slips move radially and engage said tubular with a force substantially perpendicular to the longitudinal axis thereof.

55. (New) A slips assembly as claimed in Claim 54, wherein said one end of said link is pivotally mounted to said slip via a first pin wherein the other end of said link is pivotally mounted to said support by a second pivot pin, and a line drawn through said first pin and said second pin is substantially parallel to the longitudinal axis of said tubular when said slip engages said tubular.

56. (New) A slip assembly as claimed in Claim 54 in which the means comprises a wedge which, in use, contacts a sloping external surface of the slip whereby moving the wedge over the said sloping external surface causes radial movement of the slip towards the tubular.

57. (New) A slip assembly as claimed in Claim 54 in which the means comprises a first wedge and a second wedge wherein, in use, the first wedge contacts one side of the second wedge and the other side of the second wedge contacts a sloping external surface of the slip whereby moving the first wedge causes radial movement of the slip towards the tubular.

58. (New) A slip assembly as claimed in Claim 57 further comprising a spring located between said first wedge and said second wedge.

59. (New) A slip assembly as claimed in Claim 57 wherein the first wedge is a coarse wedge and the second wedge is a fine wedge.